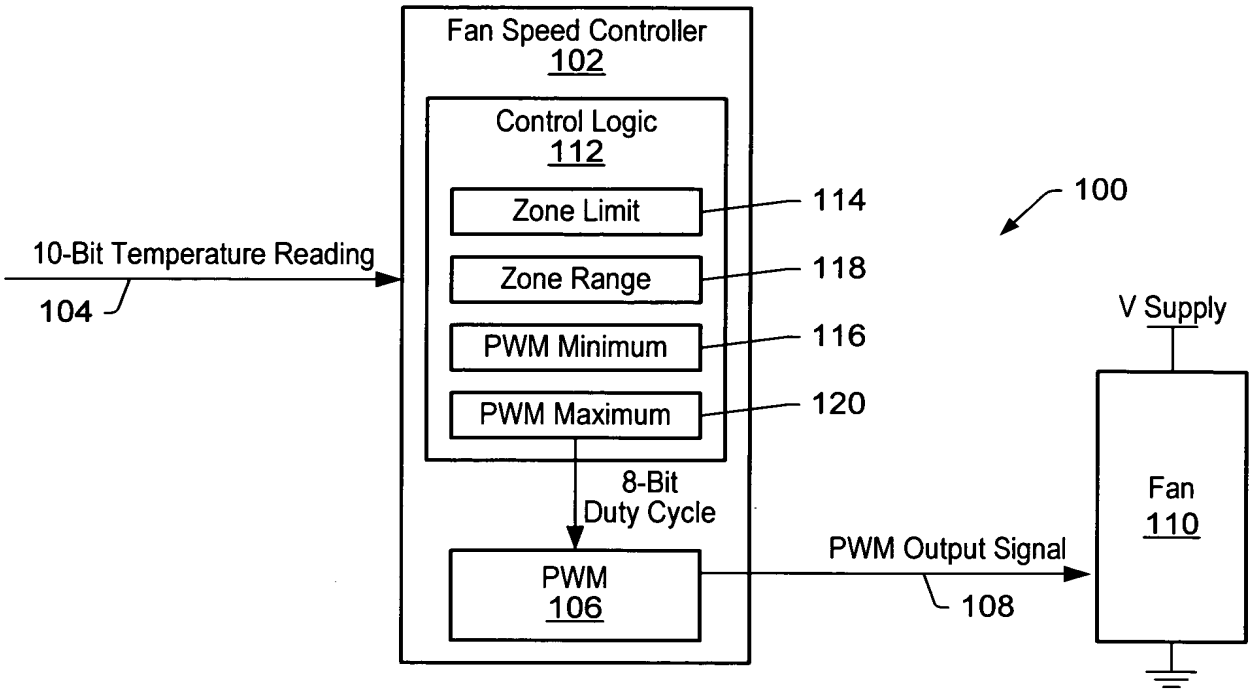
Fan Speed Controller
102
Control Logic
112
Zone Limit
Zone Range
PWM Minimum
PWM Maximum
114
118
116
120
100
10-Bit Temperature Reading
104
8-Bit
Duty Cycle
PWM
106
PWM Output Signal
108
V Supply
Fan
110

FIG. 1

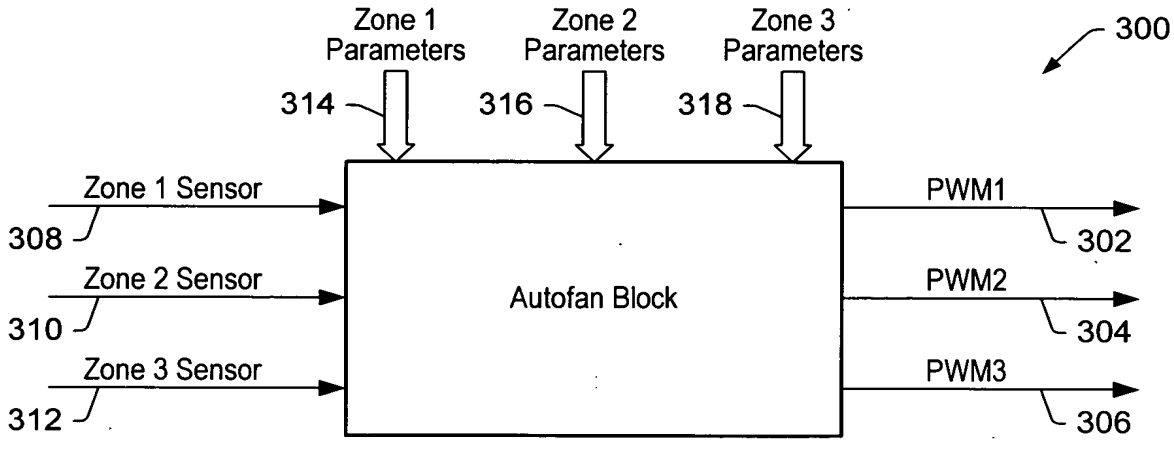
Zone 1
Parameters
Zone 2
Parameters
Zone 3
Parameters
300
314
316
318
Zone 1 Sensor
308
Zone 2 Sensor
310
Zone 3 Sensor
312
Autofan Block
PWM1
302
PWM2
304
PWM3
306

FIG. 3

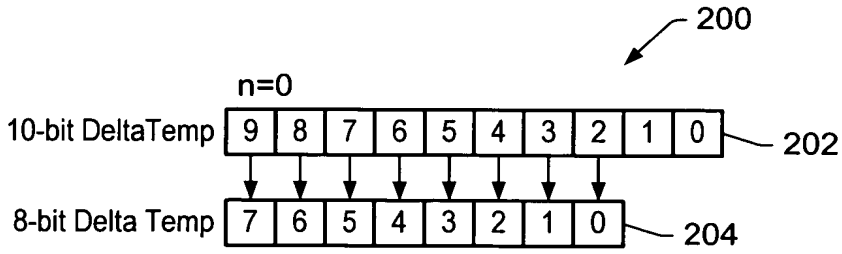

FIG. 2A

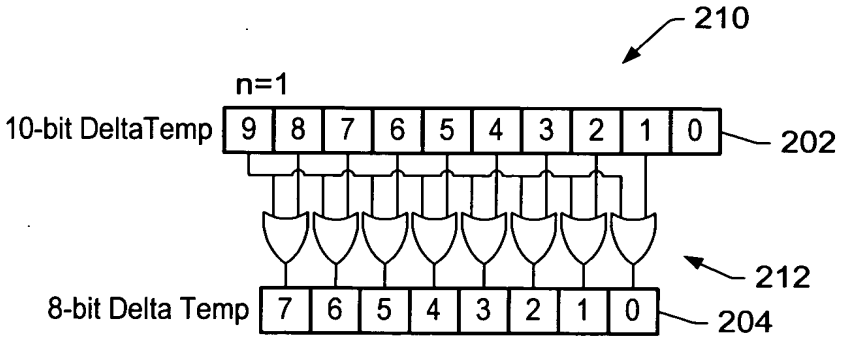

FIG. 2B

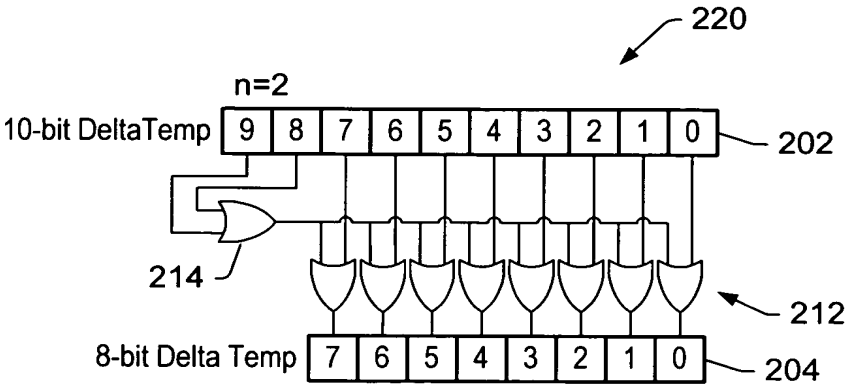

FIG. 2C

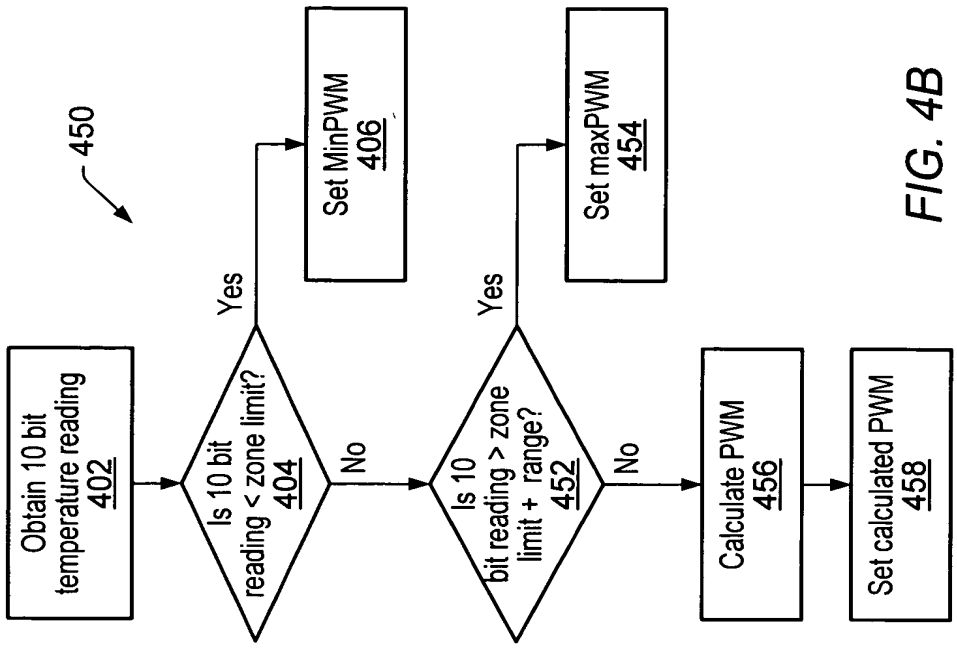
450
Obtain 10 bit temperature reading 402
Is 10 bit reading < zone limit? 404
Yes
Set MinPWM 406
No
Is 10 bit reading > zone limit + range? 452
Yes
Set maxPWM 454
No
Calculate PWM 456
Set calculated PWM 458

FIG. 4B

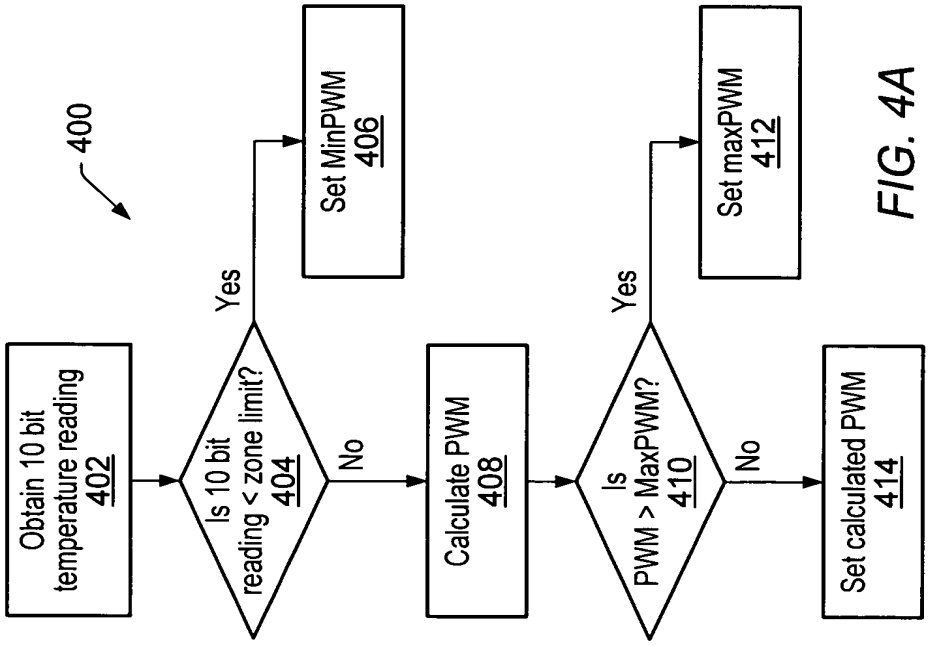
400
Obtain 10 bit temperature reading 402
Is 10 bit reading < zone limit? 404
Yes
Set MinPWM 406
No
Calculate PWM 408
Is PWM > MaxPWM? 410
Yes
Set maxPWM 412
No
Set calculated PWM 414

FIG. 4A

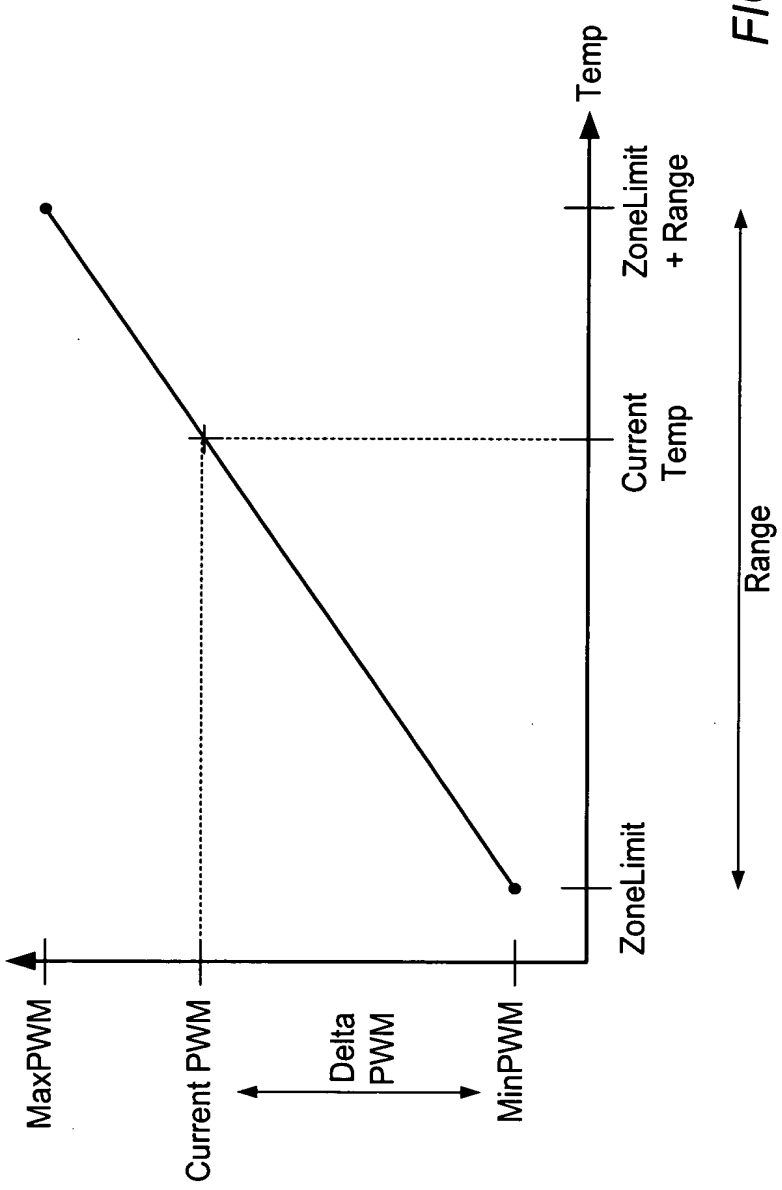
MaxPWM
Current PWM
Delta PWM
MinPWM
ZoneLimit
Current Temp
ZoneLimit + Range
Temp
Range

FIG. 5

Table 1- Range Selection represented as Mantissa and Divider

Range Selection Bits	Range °C	(1/Range °C) /256	Binary Representation (1/Range °C)/256	Mantissa	Divider used for Shift
0000	2	128/256	.10000000	10000000	0
0001	2.5	102.4/256	.01100110	01100110	0
0010	3.33	76.8/256	.01001101	01001101	0
0011	4	64/256	.01000000	10000000	1
0100	5	51.2/256	.00110011	01100110	1
0101	6.67	38.4/256	.00100110	01001101	1
0110	8	32/256	.00100000	10000000	2
0111	10	25.6/256	.00011001	01100110	2
1000	13.33	19.2/256	.00010011	01001101	2
1001	16	16/256	.00010000	10000000	3
1010	20	12.8/256	.00001100	01100110	3
1011	26.67	9.6/256	.00001001	01001101	3
1100	32	8/256	.00001000	10000000	4
1101	40	6.4/256	.00000110	01100110	4
1110	53.33	4.8/256	.00000100	01001101	4
1111	80	3.2/256	.00000011	01100110	5

FIG. 6A

Table 1: Computing LSbits for DeltaTemp[1:0] = CurrentTemp

Current Temp	Zone Limit	DeltaTemp[1:0]
POS.xx	POS.00	xx
POS.xx	NEG.00	xx
NEG.00	NEG.00	00
NEG.01	NEG.00	11
NEG.10	NEG.00	10
NEG.11	NEG.00	01
NEG.xx	POS.00	Can't Happen

Note: POS = Positive number; NEG = Negative number; .xx => Current Temp [1:0] = don't care; the decimal point followed by 2 numbers represents the 2 LSbits of the value. They are binary numbers.

Note: The autofan algorithm only computes DeltaTemp when the Current Temp is greater than or equal to the Zone Limit.

Note: All cases, except those in the shaded rows, the two LSbits of the Current Temp become the two LSbits of DeltaTemp.

FIG. 6B